Section 1: The case for HGH
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Google Earth suggests Super Bowl XLI will be held on terra firma. From space, it shows that Dolphin Stadium sits on a patch of concrete six miles to the west of North Miami Beach and well east of the Everglades.

But just as so much of South Florida was built on swampland, the whole skull-rockin', bone-crushin', rump-shakin', cameras-clickin', fireworks-flyin', teammates-prayin', sponsors-payin' spectacle really floats on a teeming pool of man-made fluids: sweat, blood, spit, adrenaline, taurine, cortisone, tears. And if history is any guide, at least a few of the game's gladiators will repair to their homes in the ensuing days and resuscitate their smashed bodies with yet more fluid, this time human growth hormone, or maybe straight testosterone.

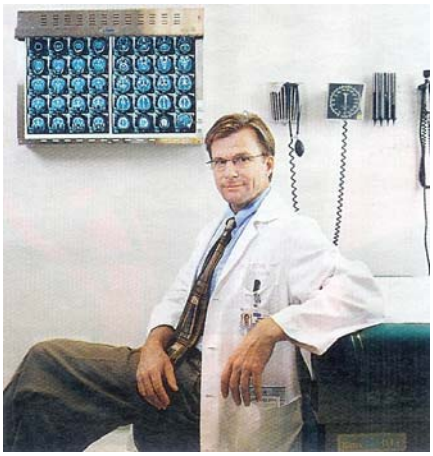
If Google Earth could zoom in to show the players' faces, we probably wouldn't see much shame on them. In the future there won't be much scorn on ours, either. Because it's likely that within a few years, expanded use of these drugs will become permissible, under a doctor's supervision and with checks in place to prevent abuse.

Sure, it's hard to imagine now that the league would ever offer a seat at the sports medicine roundtable to the Beavis and Butt-Head of jock dope. Didn't Congress just get done using the NFL's well-regarded drug policy to club Bud Selig and Don Fehr into submission? And the public has been deeply conditioned to think of these drugs in sinister terms, at least when it comes to sports: Any athlete using them is a cheater. Meanwhile, short-statured kids are prescribed HGH injections, AIDS patients get testosterone to combat their wasting away, and baby boomers take related compounds to stay young. A simplistic, good-and-evil judgment of these substances won't continue to hold.

The NFL already lets some players use them (and no, we're not referring to the gaps in its testing program you could drive a stretch Hummer through). Behind closed doors, the league's drug adviser, John Lombardo, has granted waivers to players who have failed drug tests but then explained their medical need for testosterone. NFL spokesman Greg Aiello won't disclose names or reveal how many players have been allowed to pump synthetic hormones into their bodies except to say it's "a very small number."

In each case, he says, testicular disease was the medical rationale. It's a little-used exemption to the league's drug policy, but it's a precedent-setting one: Any player who can show that replacing hormones is critical to his continued health should be allowed to take them.

PLAYERS WITH testicular disease are not the only ones in need. At the base of the brain, encased in a small, bony shell, is a pea-size gland called the pituitary, which secretes hormones that help regulate everything from mood to energy level. For years,



the gland had been overlooked in discussions of head trauma. But in the late 1990s, UCLA neurosurgeon Daniel Kelly noticed that many of his head-injury patients suffered from symptoms associated with pituitary failure: depression, fatigue, anxiety, poor concentration. His findings, which he published in 2000, have led to at least eight studies on three continents, which together involved more than 600 subjects. Each study confirmed the link between traumatic brain injury (TBI) and a loss of hormonal function. The most common deficiencies in men were those of growth hormone, which occurred in 15% to 20% of cases, and of testosterone, in 10% to 15%.

Most of the subjects in these studies had suffered a moderate or severe TBI with some bleeding in the head during a car accident, a fall or some other nonsports-related activity. But, Kelly says, "if you look at the literature, there's a small but definite component of patients with milder head injuries who also lose hormonal function." One study, in Italy, found pituitary dysfunction in as many as 37.5% of patients with mild TBI, the same level of injury NFL players typically incur when they get dinged.

Kelly has plans to propose an evaluation of football players to the Center for the Study of Retired Athletes at the University of North Carolina, which is affiliated with the NFLPA. Another doctor who has done pioneering work in this area, Galveston neurologist Brent Masel, says of the potential study group, "I'd expect significant numbers would have decreased levels of growth hormone."

So far, nearly all of the medical focus on NFL head injuries has centered on concussions. Even players who get pulled from games rarely, if ever, get checked for pituitary damage. But researchers in Turkey, in a 2004 study, found growth hormone deficiency to be "very common" among boxers. The sample was small, just 11 top male amateurs, but the results were striking because the number of boxers who may have had deficiencies -- 45.4% -- was so much higher than that of the general population, which is usually less than 5%. More recently, those same researchers published findings from a larger sample, this time 22 kickboxers; 23% showed growth hormone deficits.

You may have noticed that football players get knocked around too. In fact, NFL research has found that collisions in its game pack more than punches delivered in a ring do. "Think of being hit by a small car that is really fast and by a large truck that is not as fast but has much more mass behind it," says David Hovda, director of the UCLA Brain Injury Research Center. "The damage from the truck collision is higher." Even on the college level, some collisions register at more than 120 G's, the equivalent of a severe car crash.

We begin to produce less growth hormone when we reach our 20s, and there is a slight drop-off every year until we're old and gray. Similarly, damage to the pituitary can make the victim feel like he's earned his AARP card prematurely. Markers, beyond those mentioned above, include loss of lean muscle and bone density, increase in fat mass and heightened risk of heart disease. Says retired Jacksonville Jaguars offensive

lineman Jeff Novak, who stays in touch with many former teammates: "I know a lot of guys with several of those symptoms."

It's not the ideal scenario for a long, happy life, let alone for a pro trying to keep his job as he fights through injuries. "There will be a subset of people for whom hormone deficiencies do partly explain their problems," says Kelly, whose work has been funded by the National Institutes of Health. "Is that 10%, 25%, 40%? I don't know. But the issues these retired players are facing are all the more reason to look into it."

KIDZ BOPPED

Most football-related brain injuries aren't suffered on NFL fields or college turf. The real danger zone is high school, where 280-pound senior linemen pulverize freshman tailbacks half their size. Some boys have come through puberty, some have not, and the outcome is often not pretty. Football accounts for nearly two-thirds of the estimated 62,816 mild traumatic brain injuries (TBI) incurred in high school sports each year, according to a 1999 article in *The Journal of the American Medical Association*.

How many of these players will have damaged their pituitary is no more certain than it is with their pro peers. But an NFL-funded 2006 study does suggest that the brains of high school players don't recover as quickly from TBI as those of the pros do. And because the chemicals produced by the pituitary and nearby hypothalamus play a key role in physical and neurocognitive maturation, the injuries are more serious in teens. "It's probably more important for kids to get treatment than adults because they're still growi says Sandra Chapman, director of the Center for BrainHealth at University of Texas-Dallas.

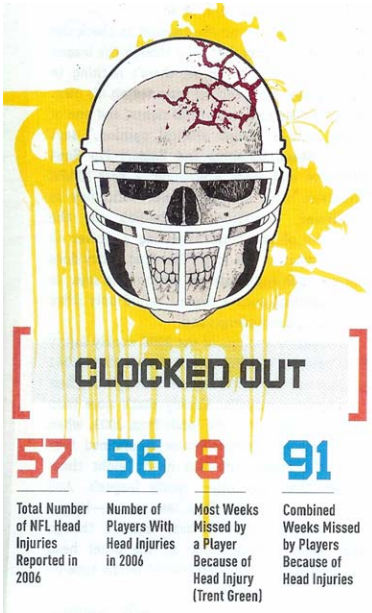
Last year, researchers in England found cases of children who, like adults, suffered hormonal deficits after mild head injuries. Some hadn't even lost consciousness. "I would b opposed to my kid playing football," says Brent Mase a leading researcher of TB and pituitary dysfunction. But he realizes that won't be every parent's respons For them, he recommends staying alert to the potent for hormonal loss from he trauma. And, he points ou a $300 blood test can begi put a worried parent at ea

Brad Leggett isn't waiting for the final numbers: The former USC and New Orleans Saints center takes HGH prescribed by a doctor. He knows of other retired NFL players who do too. "I'm a huge believer in medically supervised use of growth hormone," says Leggett, who now co-owns a nutrition company in Atlanta. "The aches and pains I had from playing football, I don't have anymore."

AIELLO SAYS the league's medical advisers are following the research. But he also says they haven't been moved to act because they don't believe it applies to the head injuries seen in football or other sports. "We are not aware of any studies linking mild TBI and hormonal deficiency," Aiello wrote in an e-mail. So while Masel and Kelly agree that testing current players with a history of concussions for hormone deficiencies is a good idea, the NFL isn't nearly ready to institute it.

The league is in a precarious situation. Even if it were willing to test for deficiencies, the fact remains that the medically accepted therapy calls for hormones that have been banned. To complicate matters further, head trauma isn't the only way to wreck a pituitary. Taking high amounts of steroids can shut down the natural production of hormones as well, at least temporarily. Understandably, the NFL doesn't want to create a scenario in which drug-abusing players who show a hormone deficiency are rewarded.

There's another dilemma for the NFL if it finds proof that the game causes pituitary dysfunction: The courts are



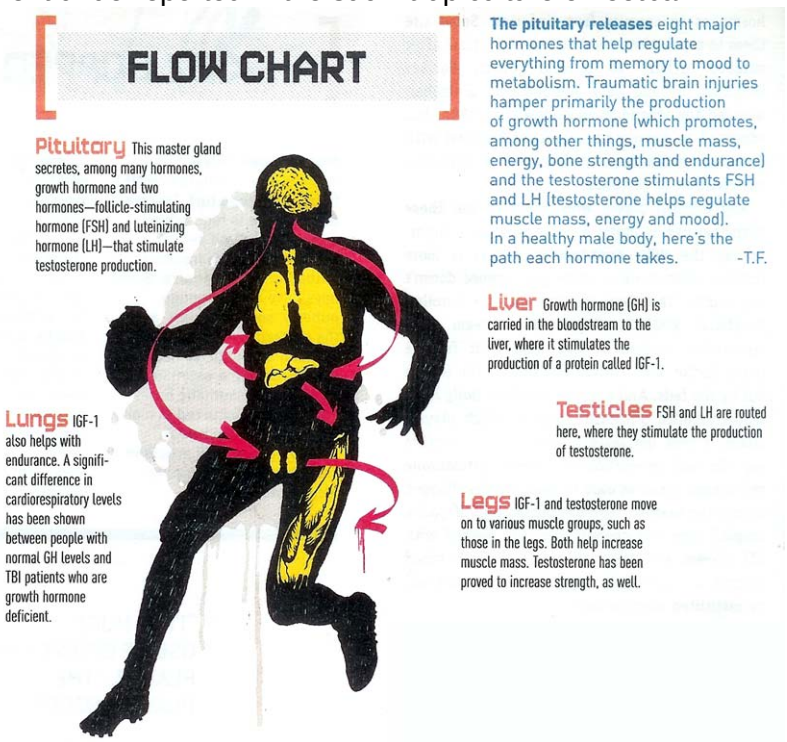
CLOCKED OUT

57	56	8	91
Total Number of NFL Head Injuries Reported in 2006	Number of Players With Head Injuries in 2006	Most Weeks Missed by a Player Because of Head Injury (Trent Green)	Combined Weeks Missed by Players Because of Head Injuries

now taking head trauma seriously as a disability. In December, a federal appellate panel unanimously sided with the family of the late Mike Webster, awarding his estate nearly $2 million for benefits the league and union had denied him. The court agreed that the Steeler's brain was damaged during his 17-year career and that the injury continued to hobble him after his playing days ended, in 1991. He delivered a somewhat incoherent speech at his Hall of Fame induction, in 1997, and died five years later, at 50.

In Webster's day, no one thought to check the pituitary for injury. But even though the league still isn't willing to do so, there's nothing to stop a player from getting screened on his own. "Players need to pursue their rights, and one of those is to a second medical opinion," says former Bears, Dolphins and Raiders Pro Bowl defensive end Trace Armstrong, a past NFLPA president. And if a hormonal deficiency is confirmed, Armstrong is bullish on the prospects of the player's getting a waiver to replace what he has lost. "The drug policy does not preclude any treatment option," he says. In fact, rejecting such a request would only drive more drug use underground.

A *Magazine* analysis of the 2006 weekly injury rolls released by NFL teams found that 1,041 players suffered 1,836 injuries through the first round of the playoffs. Already that's more than a 10% increase over the totals from 2003, when the *Pittsburgh Tribune-Review* determined that the NFL's injury rate was nearly eight times higher than any other sports league's. And 56 players -- 11 more than last season -- logged time on the lists with head injuries, though that doesn't account for all the other head injuries that went underreported in the suck-it-up culture of football.



Already, athletes are discreetly acquiring hormones to recover from injuries. Some use them to repair tissue and cut recovery time after surgery, others to rebuild joints. Former Dolphins running back Abdul-Karim al-Jabbar, who led the league in touchdowns in 1997, has admitted to having had his knee injected with growth hormone late in his career to stimulate the creation of cartilage.

Any football player who wants to use these hormones can be pretty sure he won't get caught. To say the NFL's drug-testing system is more rigorous than those of other pro leagues doesn't say much. The four starters on the Carolina Panthers' 2003-04 Super Bowl team who reportedly received steroids and HGH from a rogue doctor were sniffed out not by the league but by the feds. And a recent New York *Daily News* report detailed off-season gaps in which players rarely, if ever, get tested. Underground chemists say the new generation of rub-on testosterone

gels makes it just as easy to avoid getting flagged during the season. "You get busted only if you're stupid," says one chemist who has worked with NFL players. And unless the union agrees to blood testing, it doesn't look like a screen for HGH will be instituted anytime soon.

LET'S SUPPOSE for a moment that the NFL wants to adapt its drug policy to the realities of 21st-century medicine. Could it make the changes without turning the game into more of a chemical freak show than it may already be? Of course -- as long as it is willing to make the health needs of its players, as opposed to the dubious ideal of a level playing field, its No. 1 priority. Envision a transparent system in which players with confirmed, legally recognized medical conditions get advance consent to use therapeutic doses of hormones, with controls that ensure real doctors are making real diagnoses.

A good case can easily be made for HGH, which has been proved to add muscle size but, unlike testosterone, not necessarily strength. "You should be able to give growth hormone to someone who is deficient," says Joseph Maroon, the Steelers neurosurgeon since 1977. "It's the supramaximal amounts you want to avoid." Mark Gordon, a Los Angeles doctor who has prescribed hormones to retired NFL linemen, says players with waivers would have to agree to monitoring to ensure that their levels stay within the normal range. The league could help itself by ramping up its commitment to research and testing that weeds out drug abusers -- those seeking to enhance, not just enable, performance. This progressive framework has the added benefit of better preparing the NFL to negotiate other upcoming challenges, from genetic doping to the use of stem cells.

Radical as this scenario appears, much of it is already in play elsewhere. "What you're saying is exactly what we're doing," says Olivier Rabin, science director for the World Anti-Doping Agency, the Olympic testing overlord. "On the one hand is the fight against doping. But the health of the athlete comes first." International sports federations overseen by WADA have granted 15 therapeutic-use exemptions for HGH and 26 for testosterone.

Despite the league's protests, a court ruled that Webster's playing days had left him dazed and damaged.

The numbers ultimately could be higher in the NFL if it turns out that on-field head trauma is compromising more than a few pituitaries. It's a physical game played at high speeds, and no one -- not the players, not the league, not the fans -- wants that to change.

But that doesn't mean the way players are treated can't. If and when that does happen, we will cheer with a clear conscience the open-field hit that leaves a man as cold as our game day beer. Because we'd know there are effective -- and honest -- remedies.